DOCUMENT RESUME

ED 173 066 SE 026 846

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TITLE Women in Engineering Revisited.
PUB DATE 78
NOTE 10p.; Not available in hard copy due to copyright restrictions; Contains occasional marginal legibility ; Paper presented at the Annual Meeting of the New York Academy of Sciences (New York, New York, March 6-8, 1978)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Career Choice; *Career Opportunities; *Engineering; Equal Opportunities (Jobs); *Females; *Professional Occupations; Science Education; Sex Discrimination; Womens Education

ABSTRACT

Engineering as a profession for women is examined. Although 1.0% of the engineering population is presently female, undergraduate enrollment has been increasing steadily since 1970. Some universities today have women representing 10-15% of their engineering enrollment. Beginning salaries are higher for female engineers than for male engineers, but there is controversy as to what happens after the first job. Initially women have the job advantage, but once employed, the promotions come more slowly and salaries are lower on the average. (Author/MA)

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WOMEN IN ENGINEERING REVISITED

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Presented at
New York Academy of Sciences Conference
on
"Expanding the Role of Women in the Sciences"
New York, New York
March 6-8, 1978

SE 026 846

CN 001253

WOMEN IN ENGINEERING REVISITED

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SUMMARY

Although women make up an unimpressive 1.0% of the engineering population, their ranks are growing. Undergraduate enrollment has been increasing rapidly since 1970 and some universities today have women representing 10-15% of their engineering enrollment. Beginning salaries are higher for women than for men but there is considerable controversy as to what happens after the first job. Women initially have it better than men in engineering but the advantage disappears fast and after the first five years the trend changes and the reverse is true.

INTRODUCTION

One of the major deterrents to women considering engineering as a career is the all-male image. This barrier is rapidly disappearing as the engineering image changes from that of a hard-hat roustabout at a construction site to that of a thoughtful, logical individual who is genuinely interested in solving the engineering and social problems which face us today. True, she may still show up at a construction site in her hard hat, but her time is more apt to be spent at a desk working on new solutions. A female engineer—unlikely? Not quite.

Although women make up an unimpressive 1% of the engineering population, their ranks have been growing. The latest Society of Women Engineers survey of schools accredited by the Engineering Council for Professional Development shows that female engineering enrollment increased

from 1,035 during 1959-60 to 11,746 during the 1975-76 school year. This increase may not be as large as it appears on the surface. Only 128 schools replied to the 1959-60 survey. But with the advent of the Civil Rights Act of 1964 and, more recently, the implementation of the federal affirmative action program, as well as an increased awareness on the part of the schools, 167 responded last year. However, since the number of female engineering students per school has increased, even as the number of males enrolled at these schools has decreased, there is little doubt that the percentage of women enrolled in engineering undergraduate programs is growing.

JOBS COME FAST, PROMOTIONS SLOWLY

What happens when the newly minted female engineer tries to enter the field? Initially, she is sought after by almost every employer in sight. Once she is on the job, however, things change. On the average, promotions do not come as rapidly for women as they do for men.

Discrimination can be a double-edged sword, however, for unlike her male counterpart, the female engineer is highly visible, and if she does an outstanding job, she may very well be rewarded faster than a man would be. If her performance is average or slightly below average, she may be judged in terms of a number of myths. Perhaps chief among them is the notion that men (and women) don't like to work for women. In my personal experience, I have found that people who enjoy their work get it done without any thought to whether their supervisor is a man or a woman.

Some echoes of other misconceptions about women are still heard among engineers, and undoubtedly contribute to the lag in promoting women to top management ranks. Examples of these myths are: a) a company's public

image will suffer if a woman takes over a top management position, because men have traditionally been the corporate leaders; b) a woman won't travel on sales trips, to plant inspections, to professional conferences and so forth; c) women don't want to accept responsibility; d) a woman's family will always take precedence over her career. (One must ask; why shouldn't it take precedence over a man's as well?)

It has also been argued that promotion policies don't favor women because companies prefer long tenure for those elevated to executive positions, and they believe that turnover rates are greater for women. But, not only do government figures show that professional women have working careers comparable in length to those of men, it is also clear that promotions generally accrue to men regardless of age and experience. Over 20% of all male engineers are in management, as opposed to an extimated 2% of female engineers.

Admittedly, because the number of women in the profession is small, the above figure is open to sampling error. Indeed, as many as 40% of the women surveyed in 1974 by the Society of Women Engineers stated that they supervised groups which ranged in size from teams to major organizations. It must be noted, however, that members of SWE (and engineering societies in general) are probably among the more qualified and professionally active engineers.

ATTITUDES VARY

A questionnaire on discrimination was included in a 1972 SWE survey. In a classic case of "which-came-first-the-chicken-or-the-egg?" the results showed that those women who were very successful in terms of salary, responsibility, and years of experience felt they had not encountered any

discrimination. Those women who were moderately successful indicated that there was no discrimination encountered from their immediate superiors. They felt, however, that people in the upper levels of management hierarchy did discriminate and that there was some evidence of discrimination by co-workers.

Those women on the low side of the average in terms of salary and responsibility indicated that they had encountered discrimination at all levels. It can be argued that these women have less ability than their male cohorts, and use "discrimination" as an excuse for their lack of advancement.

SALARIES

All women encounter discrimination, perhaps not intentional or even conscious, from their male colleagues. This contention is borne out by the results of the SWE salary survey, compared with the results of the survey of Engineers Joint Council for the profession as a whole. For engineers with 14-years' experience (the median for women), the median salary for female engineers is $19,675 per year, while that for all engineers with 14-years' experience is $23,715 according to the EJC. Both surveys were completed in 1977. The disparity may be even greater because, again, SWE members are more professionally active than all engineers taken as a group.

Of course, the engineering profession is not alone in this disparity in salaries. In the federal civil service, men average $14,328 per year, and women only $8,578. This is not because there are separate pay scales for women, but rather because women employees are heavily concentrated in lower-grade jobs.

All is not bleak, however. In 1977, the average starting salary offered to women engineering graduates at the bachelor's degree level was

$1150 per month—$43 a month more than the average for men, according to the College Placement Council. This represents a closing of the gap when compared with 1971, when women were offered $8 a month less than men. Engineering—the profession offering the highest starting pay for those with bachelor degrees, remains the only profession where salary offers are higher for women than for men.

If one considers salary offers from private industry only, the salary gap between male and female engineers was even greater than the averages indicate, and favored women. But the federal government, which offered significantly lower salaries to entry-level female engineers than to males, dragged the overall averages closer together.

THE FUTURE?

The current energy crisis and materials shortage indicate that this country is fast moving from a state of have to have not. The only way to maintain our current standard of living is through technology, which means that engineers will continue to be in great demand. It also means that the image of engineering will continue to change as attention is focused on sociological-technological problems. Consequently, we can expect women to enter the engineering profession in greater numbers.

Further Reading

1. "Report on Women Undergraduate Engineering Students, Biennial Survey 1952-1976," Society of Women Engineers, 345 East 47th St., NY, NY 10017.
2. "Facts About Women's Absenteeism and Labor Turnover," Women's Bureau, Wage and Labor Standards Administration, U.S. Dept. of Labor, Washington August 1969.
3. "The Myth and the Reality," Women's Bureau Report WB 71-113, Employment Standards and Administration, U.S. Department of Labor, Washington, D.C. April 1971.

4. "A Profile of the Woman Engineer," Society of Women Engineers, 1978.

5. "Women in Engineering," New Engineer, March 1973.

6. "Brighter Prospects for Women in Engineering," Engineering Education, April 1974.

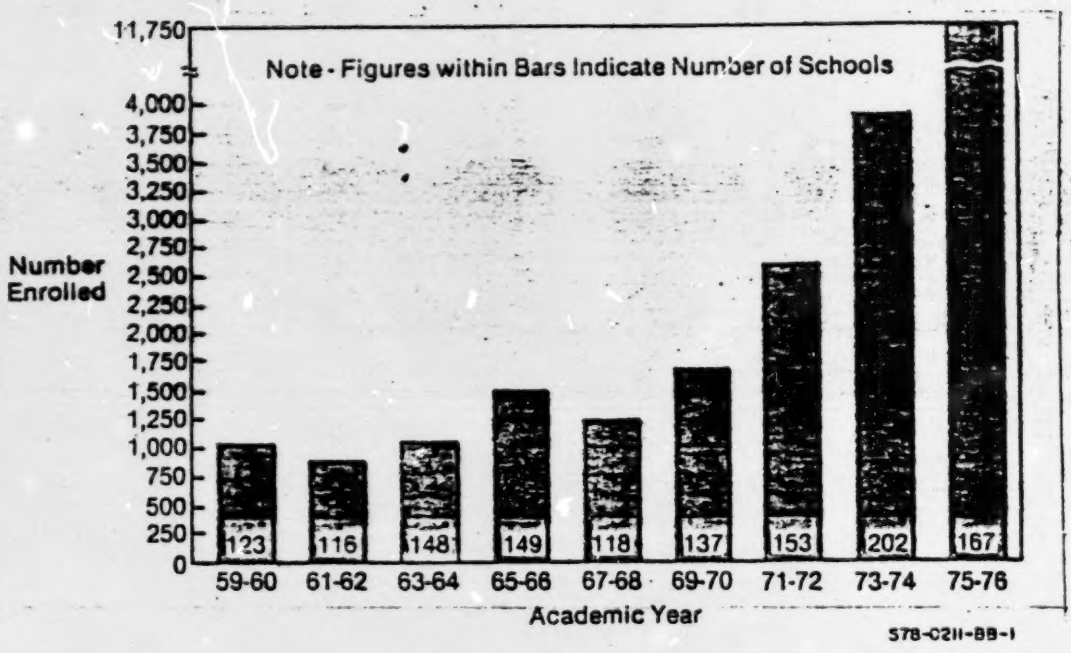

Figure 1. Enrollment of Women in U.S. Engineering Schools

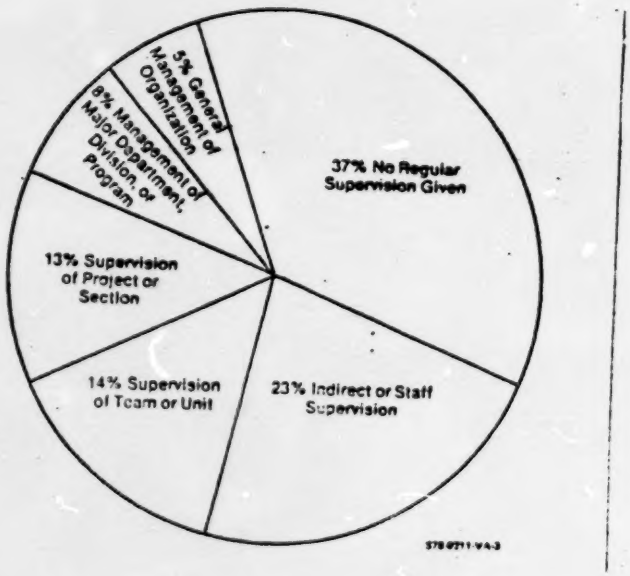
5% General Management of Organization
8% Management of Major Department, Division, or Program
37% No Regular Supervision Given
13% Supervision of Project or Section
14% Supervision of Team or Unit
23% Indirect or Staff Supervision

Figure 2. Supervisory Responsibility of Women Engineers

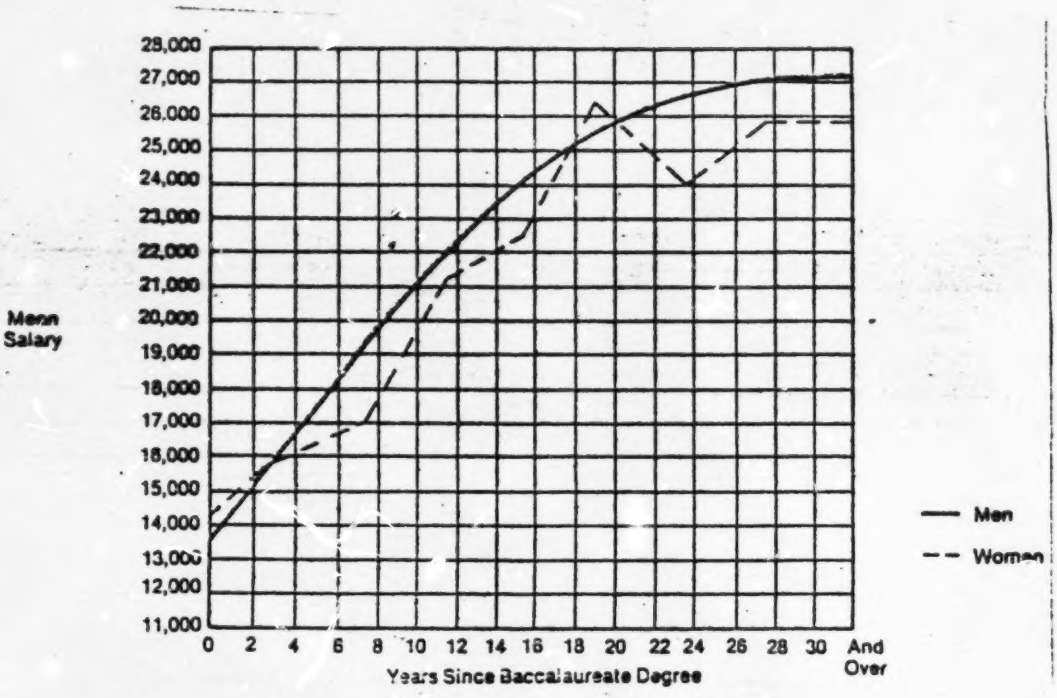

Figure 3. Comparison of Median Salaries for Female Engineers (SWE Survey) with Those for all Engineers. EJC Data

Figure 4. Distribution of Female Engineers By Field of Highest Degree